



**Program: B. Tech. Electronics & Telecommunication**

**Max. Marks: 75**

**Subject: Digital System Design (DJ19ECC303)**

**Time: 9:00 am to 12:00 noon**

**Date:**

**Duration: 3 Hours**

**Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.**

- (1) This question paper contains two pages.
- (2) **All Questions are Compulsory.**
- (3) All questions carry equal marks.
- (4) **Answer to each new question is to be started on a fresh page.**
- (5) **Figures in the brackets on the right indicate full marks.**
- (6) **Assume suitable data wherever required, but justify it.**
- (7) Draw the neat labelled diagrams, wherever necessary.

Question No.		Max. Marks
Q1 a)	What is self-complimentary property in binary codes explain with an example.	05
	<b>OR</b>	
	Represent the decimal number 432 in equivalent binary, Gray code, BCD code, Excess-3 code.	05
Q1 b)	Add the following decimal numbers in binary using 1's and 2's complement. $(-15)_{10} + (-23)_{10}$	10
Q2 a)	Simplify: i) $A' (A + B) + (B + A.A) (A + B')$ ii) $(A + C). (A.D + A.D') + A.C + C$	05
Q2 b)	Find the minimum sum of product solution using the Quine-McCluskey method. $f(w, x, y, z) = \sum m(2, 3, 7, 9, 11, 13) + \sum d(1, 10, 15)$	10
	<b>OR</b>	
	Q3 Given function $f(w, x, y, z) = \sum m(0, 2, 7, 12, 13, 14, 15) + \sum d(6, 8)$ (i) Use a Karnaugh map to find the minimized sum of product expression for f. List all the prime implicants and essential prime implicants. (ii) Find the minimized product of sum expression for f using K-Map.	10
Q3 a)	Design a 4-bit binary to Gray code convertor circuit.	05
Q3 b)	Implement the following function using 8:1 multiplexer $f(A, B, C, D) = \sum m(0, 1, 3, 4, 7, 10, 14)$	10
	<b>OR</b>	
	Implement full adder using 3:8 decoder having active low output lines.	10



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Q4 a)	Convert D Flip flop to JK Flip flop	05
Q4 b)	Explain 4-bit ring counter with timing diagram. <b>OR</b> Design an synchronous MOD5 counter using T flip flop.	10 10
Q5 a)	What are PLDs. Briefly explain different types of PLDs. <b>OR</b> Compare PAL and PLA	05 05
Q5 b)	Draw and Explain BCD adder with a neat circuit diagram	10

All the Best!